REMARKS

Claims 1–42 are pending in this application before the present amendment. Claims 1–23 and 38–41 stand rejected. Claims 24–37 and 42 are withdrawn. Claims 43–49 are added to alternately claim the invention.

The Cited References Do Not Disclose Every Element of the Independent Claims

Claims 1–4, 8, 12–14, 16, 18, 20, 22, and 23 stand rejected under 35 U.S.C. § 102(b) as assertedly anticipated by U.S. Pat. No. 4,921,818 to Lesher et al. Claims 1–14, 16, 18, 20, 22, and 23 stand rejected under 35 U.S.C. § 102(b) as assertedly anticipated by an article by Dhandapani et al. Claims 1, 12, and 13 are independent.

"To anticipate a claim, a reference must disclose every element of the challenged claim and enable one skilled in the art to make the anticipating subject matter." *PPG Indus., Inc. v. Guardian Indus. Corp.*, 37 USPQ2d 1618, 1624 (Fed. Cir. 1996); *Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick*, 221 USPQ 481, 485 (Fed. Cir. 1984) ("Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim."); MPEP § 2131. "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989); MPEP § 2131. "The elements must be arranged as required by the claim." MPEP § 2131, citing *In re Bond*, 910 F.2d 831 (Fed. Cir. 1990). "Moreover, it is incumbent upon the examiner to identify wherein each and every facet of the claimed invention is disclosed in the applied reference." *Ex parte Levy*, 17 USPQ2d 1461, 1462 (Bd. Pat. App. & Int. 1990).

Lesher et al. '818 does not disclose every element of claims 1 and 12, as amended. As amended, claims 1 and 12 recite that the composite material is made from a dense preform. Differences between the density of an exemplary preform of the present invention and the permeability of conventional materials from conventional preforms, such as disclosed in Lesher et al. '818, are discussed at paragraphs 29 and 30 of the published version of the application, US

2004/0237713 A1. Lesher et al. '818 discusses the importance of sufficient permeability at, for example, Column 3, lines 48–50 and Column 10, lines 44–45.

Likewise, Dhandapani does not disclose a composite material made from a dense preform, as claimed in the present application, as amended.

Claims 43–45 are added to alternately claim the invention with respect to density of the preform.

Lesher et al. '818 and Dhandapani also do not disclose every element of claim 13. Claim 13 recites a "silica-bonded boride- or carbide-based ceramic portion." Use of the term "silica-bonded" is discussed in the description of the present application at paragraph 20. Lesher et al. '818 indicates that any silica present is from oxidation of surface silicon carbide exposed to air. Column 4, lines 25–27. Lesher et al. '818 refers to silica as a "dopant." Column 6, lines 50–60. The dopant materials "influence" the oxidation reaction process of the parent metal. Column 6, lines 51–52. This dopant silica is not part of a silica-bonded ceramic portion.

On the contrary, the silica in the silica-bonded ceramic portion of the present invention is not just a dopant that results from oxidation of silicon carbide on the surface of the ceramic portion. Silica used in the silica-bonding of the present invention is not just present on the surface and exposed to air, but coats the ceramic particles and allows the ceramic particles to be agglomerated into a dense body. Present application, paragraph 20. In contrast, the bonding of the particles in Lesher et al. '818 is done by a material that does not participate/interfere in the reactions and includes polyvinyl alcohol, epoxy resins, latex, and the like. Column 8, lines 11–19. This bonding material of Lesher et al. '818 is separate and different from the dopant materials that influence the oxidation reaction process.

Dhandapani also does not disclose a silica-bonded ceramic portion.

Because neither Lesher et al. '818 nor Dhandapani disclose each and every element of claims 1, 12, and 13, as amended, rejection of these claims as anticipated by those references is improper. Applicants respectfully request withdrawal of the rejections under 35 U.S.C. § 102(b) based on Lesher et al. '818 and Dhandapani.

The Present Claims are Not Obvious Over the Cited References

Claims 15, 17, 19, and 21 stand rejected under 35 U.S.C. § 103(a) as assertedly unpatentable. The Office Action does not cite a particular reference or references for this rejection. From the context of the text discussing the rejection, Applicants assume that the reference is intended to be U.S. Pat. No. 4,921,818 to Lesher et al. Applicants reserve the right to address the rejection if this assumption is incorrect.

The Office Action fails to make a prima facie case of obviousness regarding the composite and articles claimed in claims 15, 17, 19, and 21.

> To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

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As discussed above, the composite claimed in claim 13 of the present invention, from which each of these claims depends, is different from the material described in Lesher et al. '818. Lesher et al. '818 does not teach or suggest all of the claim limitations of these claims. Therefore, articles comprising this new composite are not obvious. Moreover, because these dependent claims depend from an independent claim believed to be allowable, these dependent claims are also allowable, as well as being allowable in their own right.

Claims 15, 17, 19, 21, and 38–41 stand rejected under 35 U.S.C. § 103(a) as assertedly unpatentable over the Dhandapani et al. article discussed above. As discussed above, the composite claimed in claim 13 of the present invention, from which claims 15, 17, 19, and 21 depend, is different from the material described in Dhandapani. Dhandapani does not teach or suggest all of the claim limitations of these claims. Therefore, articles comprising this composite are not obvious.

The Office Action also fails to make a prima facie case of obviousness regarding the composite and articles claimed in claims 38–41.

The Office Action acknowledges that Dhandapani does not exemplify an embodiment wherein molten aluminum metal used in forming the composite comprises between 18 and 95 weight percent silicon. The Office Action asserts that Dhandapani has an embodiment using 12 weight percent silicon and that absent a teaching or showing of how the composite of the claimed invention is different from a composite using 12 percent silicon, it does not provide a patentable distinction over the prior art. "Absent a teaching of the criticality or showing of unexpected results from the claimed silicon content in the metal, it would not provide a patentable distinction over the prior art." Office Action page 7.

Applicants respectfully note that paragraphs 32 through 35 of the present application discuss unexpected results obtained from using metal having the claimed silicon content. Dhandapani does not teach or suggest using an alloy comprising aluminum and between 18 and 95 weight percent silicon, as claimed in claims 38–41 of the present application. Dhandapani only teaches using an aluminum alloy comprising 10 weight percent silicon. "The alloy used for the oxidation had a nominal composition of Al-10Si-3Zn-1Mg." Dhandapani, page 650, left column, first full paragraph. Dhandapani does not suggest or even hint at the silicon composition claimed in the present application.

There also would be no reasonable expectation of success from using the claimed metal composition with the process and material of Dhandapani. The Office Action offers only an unsupported conclusion and does not identify any suggestion or motivation to modify Dhandapani to arrive at the present invention, as is required for a prima facie case of obviousness.

Because Lesher et al. '818 and Dhandapani do not teach, disclose, or even hint at material or articles made in accordance with the claims of the present application, rejection of these claims as obvious in light of these references is improper. Applicants respectfully request withdrawal of the rejection of claims of the present application under 35 U.S.C. § 103(a).

Dependent and New Claims

The dependent claims of the present application depend from amended and unamended independent claims that are believed to be allowable. Therefore, the dependent claims are also believed to be allowable, as well as being allowable on their own merit.

New claims 43–49 have been added to alternately claim the invention. No new matter is added with these claims.

It is believed that there is no fee associated with the filing and consideration of this response in addition to that accompanying this response. **Should the Commissioner decide that any fee is due, the Commissioner is hereby authorized to charge any and all fees incurred as a result of this response to deposit account number 03-0172.**

Conclusion

Claims 1–49 are pending in the application. Claims 24–37 and 42 are withdrawn. In view of the above remarks and amendments, it is submitted that claims 1–23, 38–41, and 43–49 are in condition for allowance. Prompt notice of allowance of claims 1–23, 38–41, and 43–49 is respectfully requested.

Respectfully submitted,

Date: 2/20/06

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